



TECHNIQUE OF RECURRENT LARYNGEAL NERVE LIBERATION FOR PHONATION RECOVERY

**Radan Dzodic, MD, PhD
Professor of Surgery and Oncology**



**Institute for Oncology and
Radiology of Serbia**

**Medical School
University of Belgrade**





NO CONFLICT OF INTEREST



BACKGROUND

RECURRENT LARYNGEAL NERVE (RLN) INJURIES

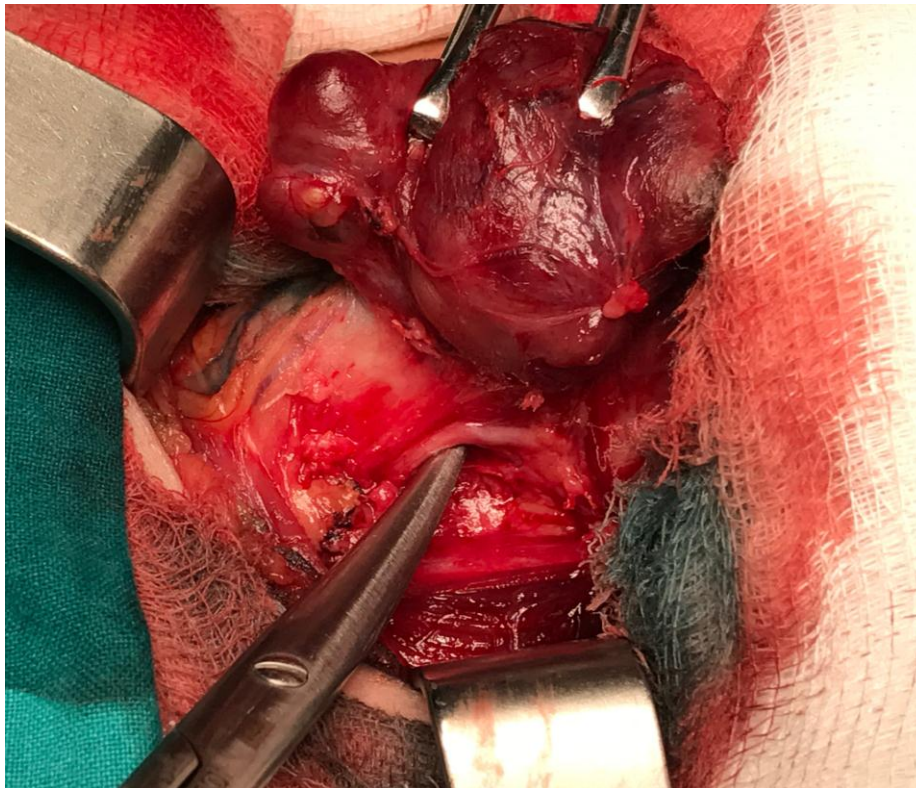
- **Thyroid surgery is the surgery of the laryngeal nerves and parathyroid glands.**
- **RLN injury is one of the major thyroid surgery complications.**
- **Rates vary in the relevant literature from 0.5 to 10%.**
- **Incidence of RLN injuries increases with the extent of surgery.**
- **It is higher in thyroid cancer surgery with extensive dissections, reaching up to 20%.**

MECHANISMS OF RLN INJURY

- **Resection**
- **Traction**
- **Contusion**
- **Thermal damage**
- **Misplaced ligation**
- **Compromised blood supply???**
- **Partial RLN layer resection (shaving)**
- **Complete or partial transection**
- **Lack of surgeon's experience is recognized as a significant risk factor for RLN palsies, as well.**

PREVENTION OF RLN INJURIES

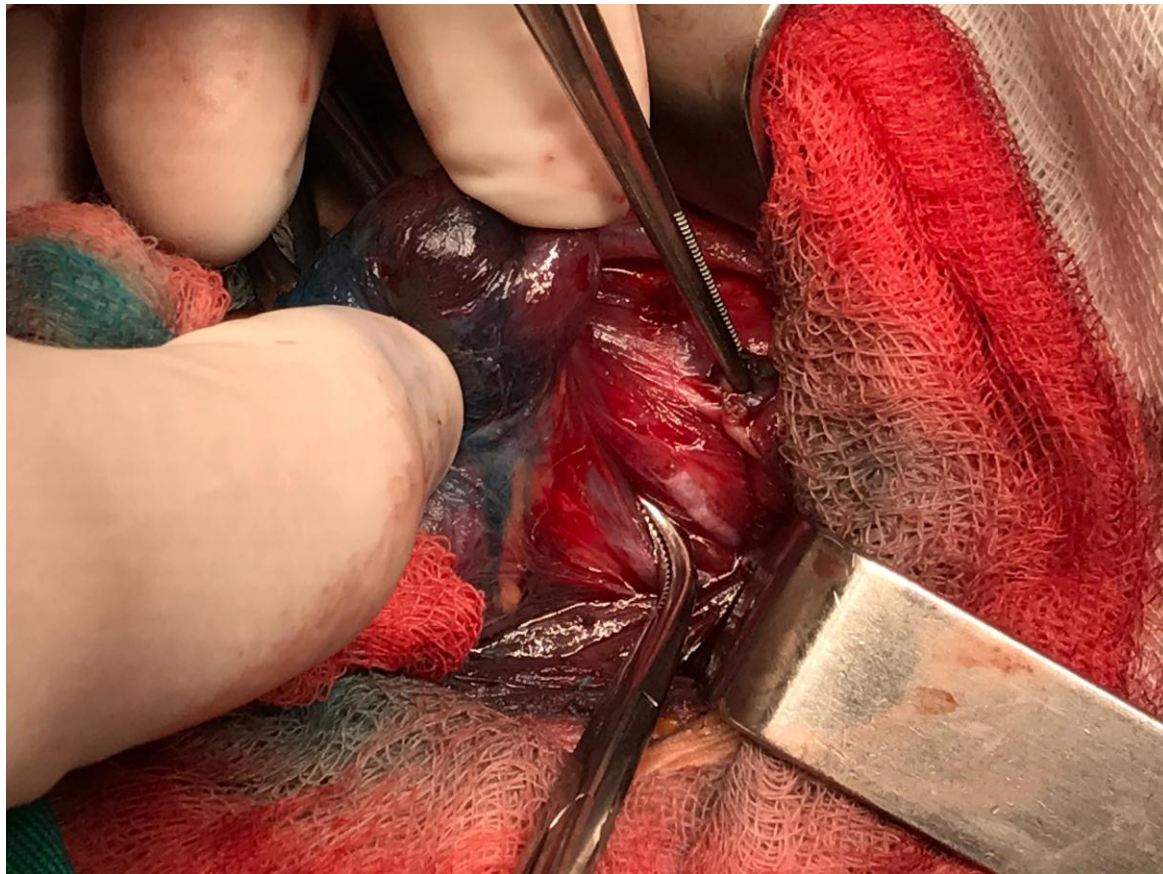
- **Visual identification and meticulous dissection is a “gold standard”.**



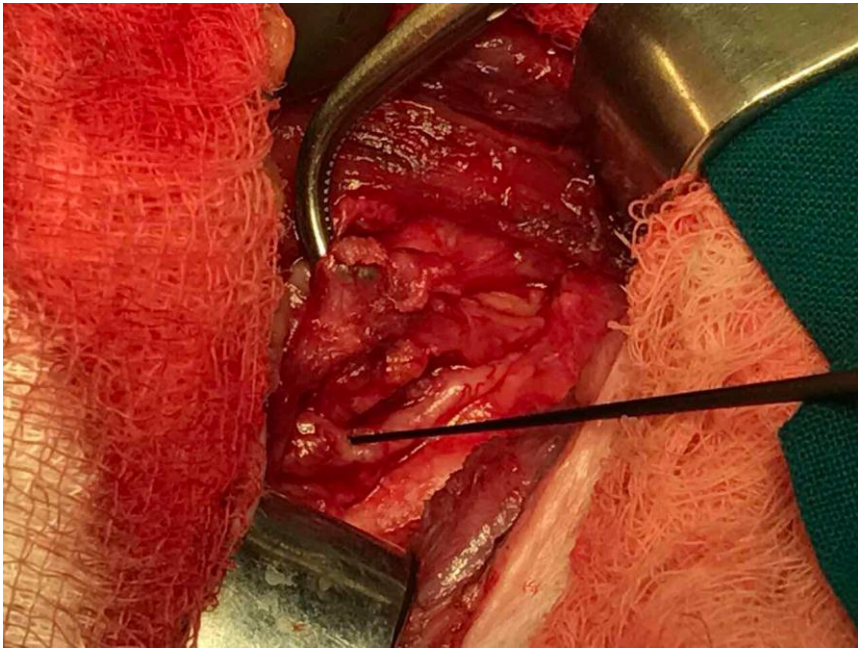
ATTENTION: non-recurrent inferior laryngeal nerve



EBSLN on the left side

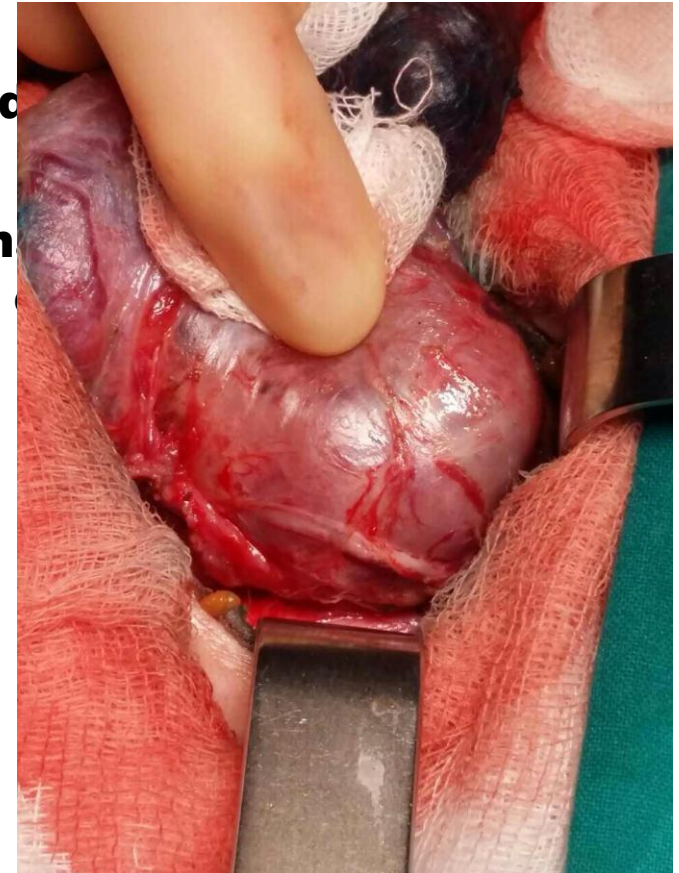


Intraoperative neuromonitoring



PATHOANATOMIC SETTINGS

- **Adhesions and fibrosis (eg. in thyroid)**
- **Distortion of anatomic landmarks**
- **extrathyroid tumor extension, gross**
- **Previous thyroid surgery**
- **Previous neck irradiation**





TREATMENT OF RLN INJURIES

- **Liberations - removing misplaced ligature or granuloma**
- **Direct suture - „end to end” anastomosis**
- **Ansa cervicalis – RLN anastomosis – ARA (Miyachi A.)**
- **Vagus to RLN anastomosis (VRA)**
- **Free nerve grafting (FNG)**
- **Thyroplasty**
- **Phoniatic rehabilitation**



THE AIM

**TO PRESENT EXPERIENCE WITH ORIGINAL
TECHNIQUE OF RECURRENT LARYNGEAL
NERVE LIBERATIONS**

**TO ANALYZE PATIENTS' RECOVERY AFTER
THE PROCEDURE**



PATIENTS & METHODS



- **Surgical Oncology Clinic IORS**
- **2000 to 2017**

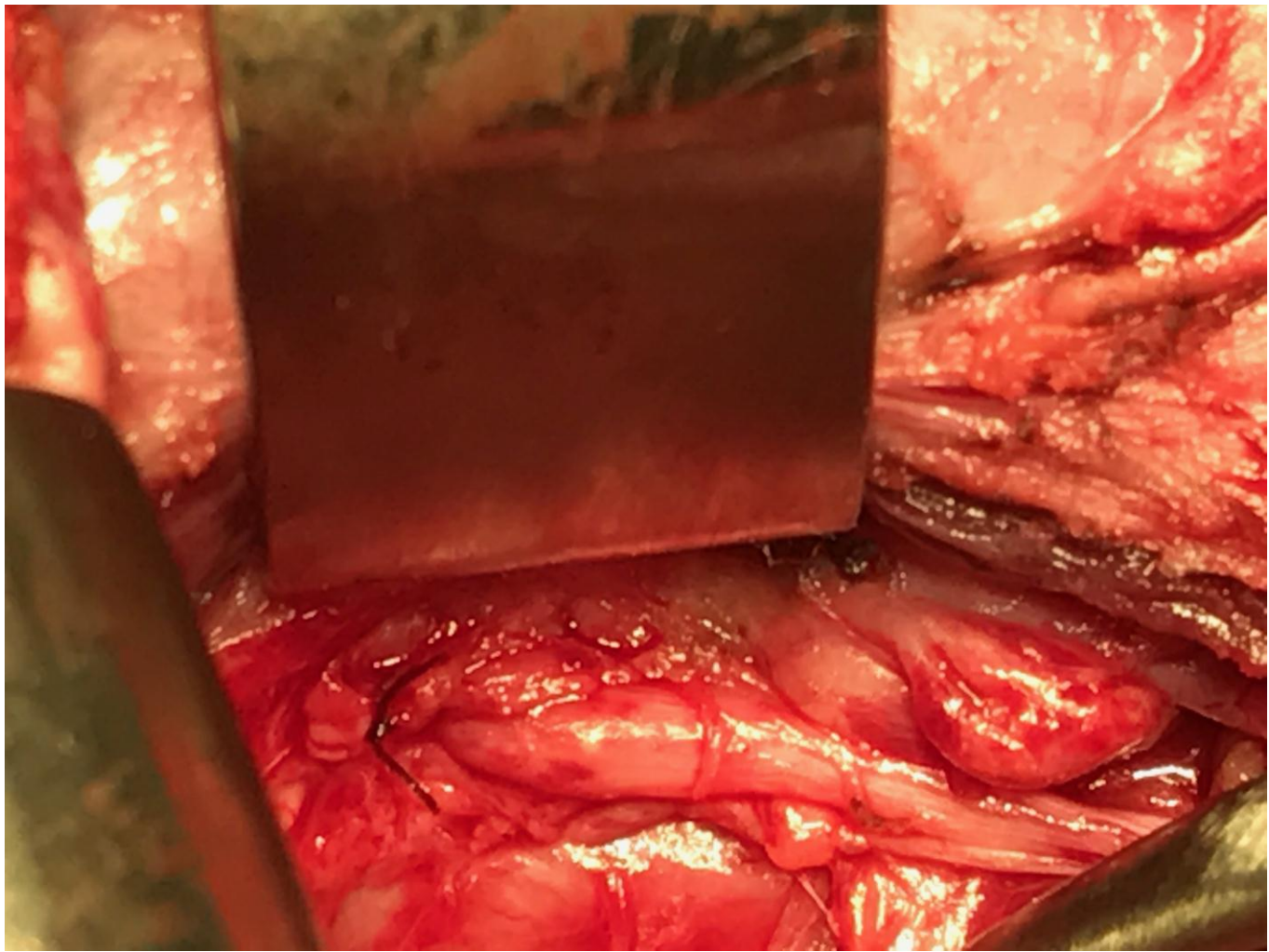
- **16 patients**
- **RLN paresis/paralysis on laryngoscopy after previous surgical treatment in another institution**

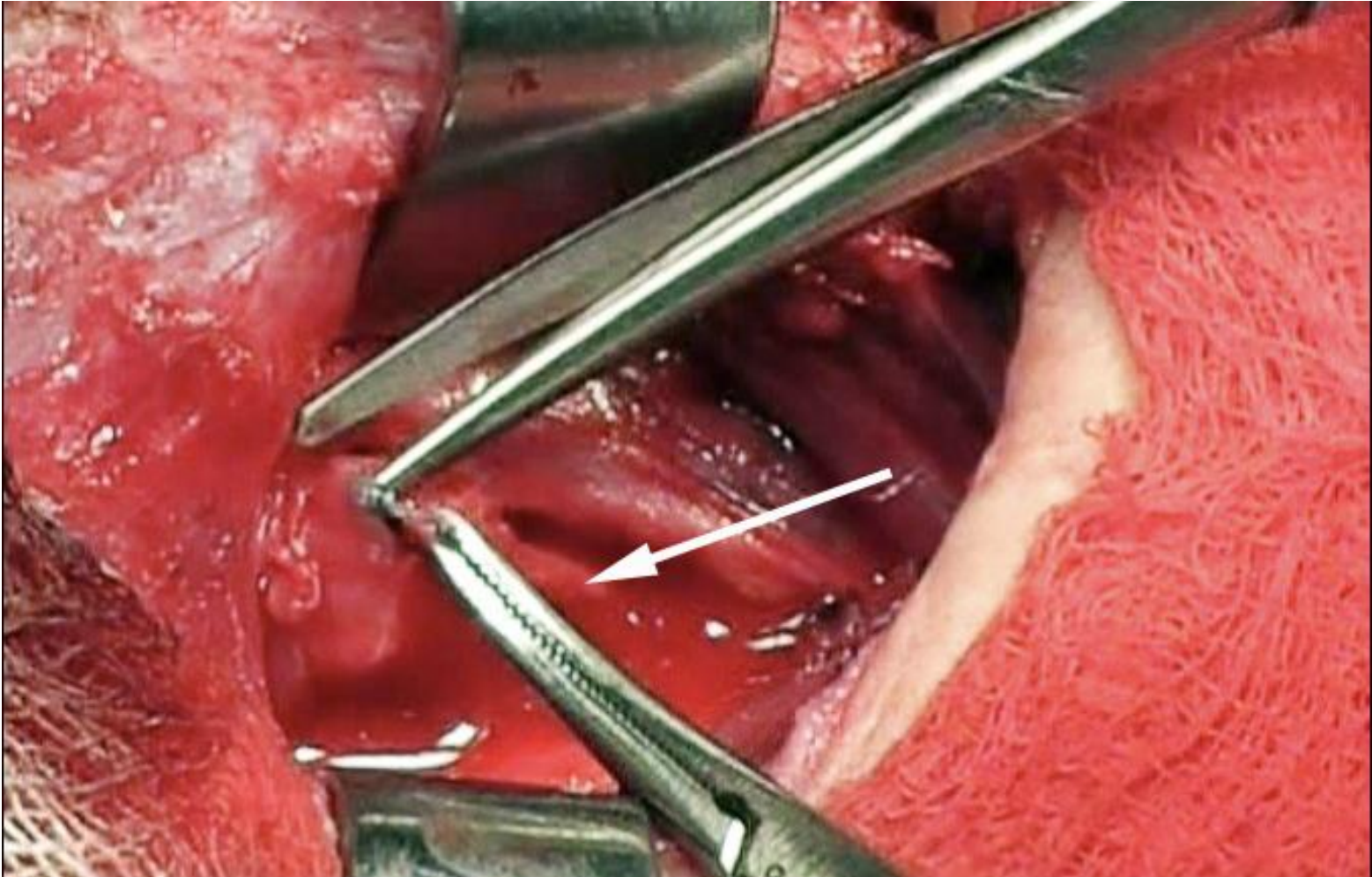
- **Reoperations were performed 2 months to 16 years after RLN injury**

- **Indications:**
 - incomplete thyroid carcinoma surgery (12 pts)
 - symptoms of severe dysphonia or stridorous breathing (4 pts)

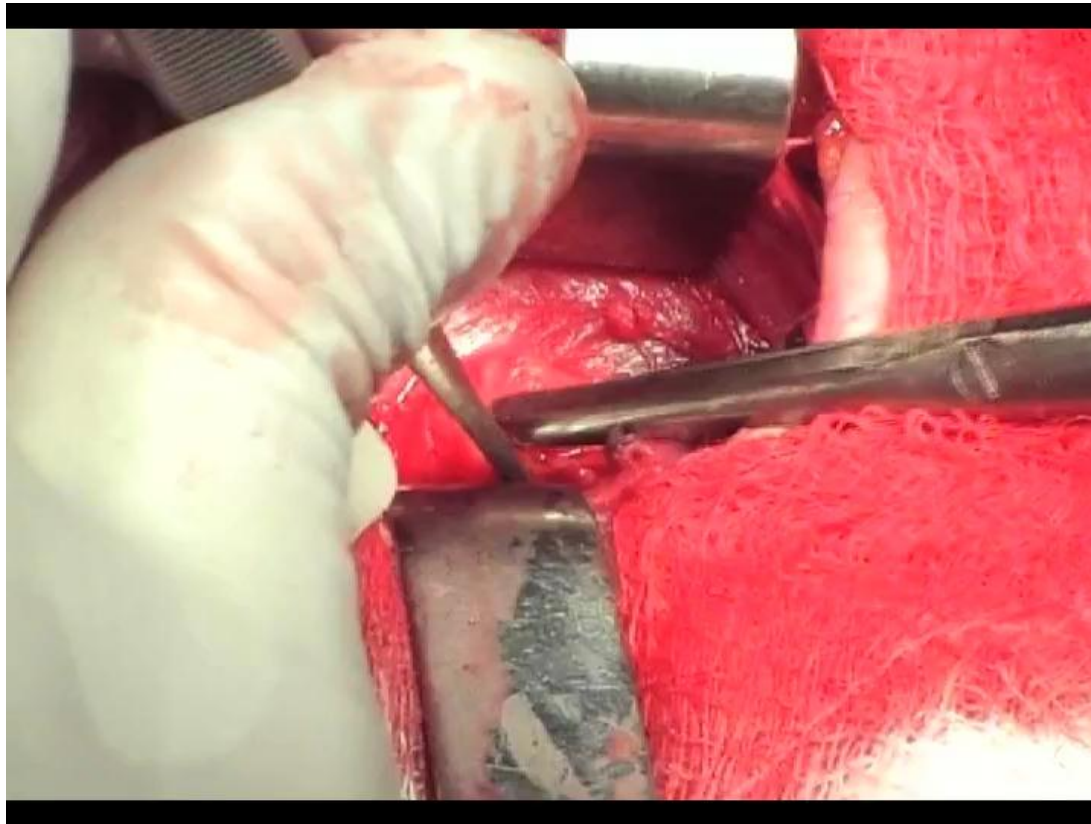
SURGICAL TECHNIQUE

- **standard neck skin incision for thyroidectomy**
- **visual identification of RLN via median line or “back door” approach**
- **verification of **misplaced ligation** on RLN near crossing of the RLN and the inferior laryngeal artery → **removal****
- **verification of **granuloma** around surgical suture near the RLN that compressed the nerve at the laryngeal entry point → **removal****





Technique of liberation



TREATMENT OUTCOME EVALUATION

Voice quality assessment by qualitative scale 0-5:

0 – stridorous breathing, severe dysphonia, vocal fatigue, whisper voice;

1 – stridorous breathing on exertion, dysphonia, vocal fatigue, whisper voice;

2 – no stridorous breathing, mild dysphonia, vocal fatigue, variations in voice tone;

3 – better phonation, occasional dysphonia, occasional vocal fatigue, variations in voice tone;

4 – good phonation, no vocal fatigue;

5 – normal phonation, normal vocal cord movements on laryngoscopy

Laryngoscopy in 1st, 6th and 12th postoperative month.

*** all patients had phoniatic rehabilitation**



RESULTS

INDICATIONS FOR REOPERATION

- **oncological indication (12 pts.):**
incomplete thyroid carcinoma surgery, local recurrence in thyroid bed or in central LNs
- **symptoms of severe dysphonia or stridorous breathing (4 pts.)**
- **two-step surgery in 2 pts. with bilateral RLN paralysis:**
2 and 6 months after injury

TREATMENT OUTCOME

- complete voice recovery **within three weeks** in all patients
- **score 4** (good phonation, no vocal fatigue) in 15 pts, without vocal cord movements

	TIME OF EVALUATION (AFTER REPAIR)	Number of patients					TOTAL
		score 1	score 2	score 3	score 4	score 5 *	
LIBERATION	3 weeks	/	/	/	15	1	16

One patient, who had RLN liberation 16 years after the injury, restored on laryngoscopy, with **score 5** on voice quality scale and **normal vocal cord movements**

**Patient with
bilateral RLN
injury, paralysis,
stridorous
breathing, severe
dysphonia, vocal
fatigue, whisper
voice**



Unilateral liberation 3 years after injury



15 days after RLN liberation

Unilateral liberation 3 years after injury



3 months after RLN liberation

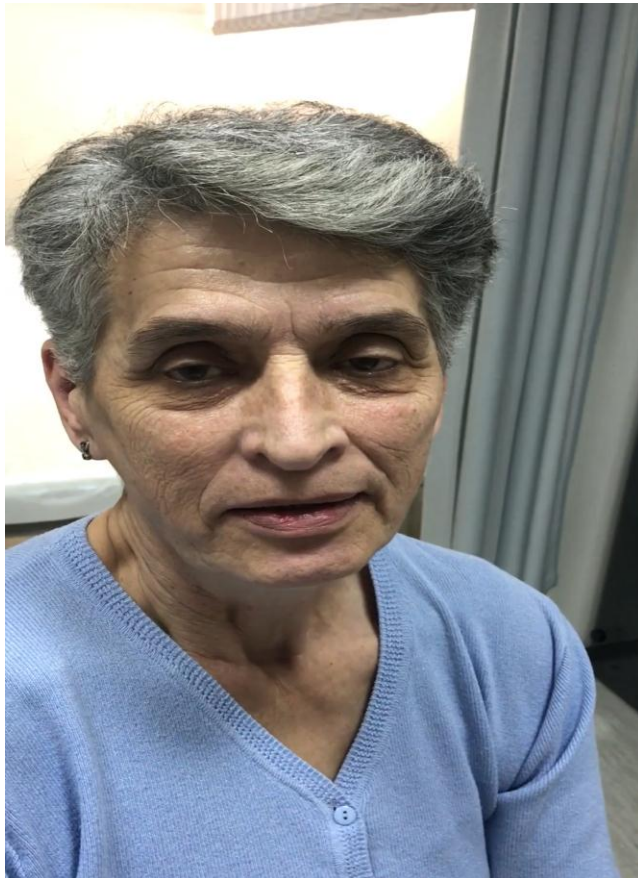
Unilateral liberation 3 years after injury



Improving maximum fonation time



Improving maximum fonation time





CONCLUSION

LIBERATION OF RLNs

- **it should be indicated in all cases when misplaced ligation is verified intraoperatively**
- **it provides significant improvement of phonation, even complete voice recovery within a few weeks from operation**
- **it is possible to achieve normal vocal cord movements**
- **it is especially beneficial for patients with severe symptomatology and poor quality of life**



THE MOST IMPORTANT IS THE IMPROVEMENT THAT PATIENTS FEEL AFTER NERVE LIBERATION

Dzodic R, Markovic I, Santrac N, Buta M, Djuriscic I, Lukic S. Recurrent laryngeal nerve liberations and reconstructions: a single institution experience. *World J Surg.* 2016;40(3):644-651.

*Recurrent Laryngeal Nerve Liberations
and Reconstructions: A Single Institution
Experience*

**Radan Dzodic, Ivan Markovic, Nada
Santrac, Marko Buta, Igor Djuriscic &
Silvana Lukic**

World Journal of Surgery
Official Journal of the International
Society of Surgery/Société
Internationale de Chirurgie

ISSN 0364-2313

World J Surg
DOI 10.1007/s00268-015-3305-0

